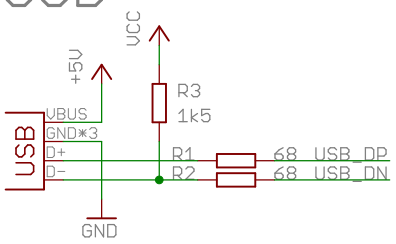
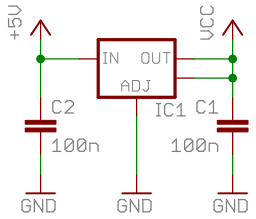
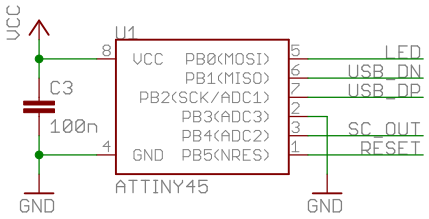
USB



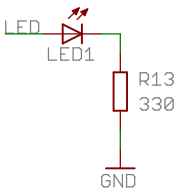
Power



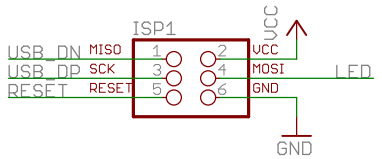
Microcontroller



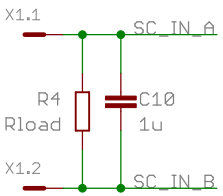
LED



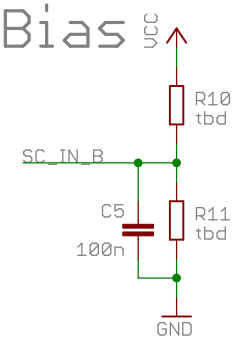
ISP



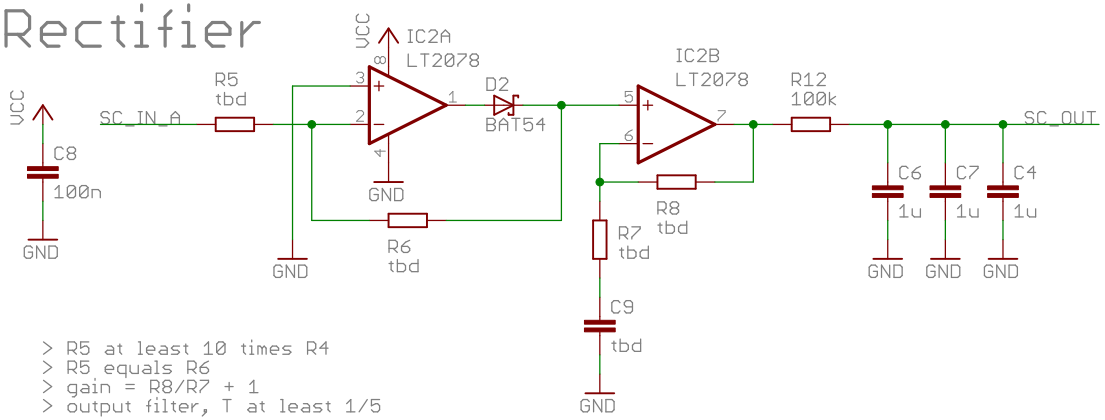
SC In



Bias



Rectifier



> R5 at least 10 times R4
> R5 equals R6
> gain = R8/R7 + 1
> output filter, T at least 1/5

```
Pmax = 6500 W
Irms = Pmax / 230 = 28.2 A
Ipk = Irms * sqrt(2) = 40.0 A
Vpk = .333 / 20 * Ipk = .665 V
Vavg = Vpk * 2 / pi = .424 V

Gain = 1.5 / 1 + 1 = 2.5
Vpk_post = Vpk * Gain = 1.664 V
Vavg_post = Vavg * Gain = 1.060 V
```

```
Input coil: CTSA010-20
Vout = .333 V for I = 20 A

Pmax = 3300 * 1.2 ~= 4000 W
Irms = Pmax / 230 = 17.4 A
Ipk = Irms * sqrt(2) = 24.6 A
Vpk = .333 / 20 * Ipk = .410 V
Vavg = Vpk * 2 / pi = .261 V

Gain = 3.3 / 1 + 1 = 4.3
Vpk_post = Vpk * Gain = 1.76 V
Vavg_post = Vavg * Gain = 1.121 V

Tfilter = 100k * 3u = .3 s = 3.33 Hz

Vavg = .333 / 20 * (P / 230 * sqrt(2)) *
       * 2 / pi * 7.8
P = Vavg / 7.8 * pi / 2 / sqrt(2) *
       * 20 / .333 * 230
```

```
RMS for sine wave

Vavg = Vpk * 2 / pi
Vrms = Vpk / sqrt(2)
```


Design by: Fabio Baltieri

TITLE: usb-current-meter

Document Number:

REV:

Date: 9/8/12 12:32 PM

Sheet: 1/1